

**Notice of Allowability**

Application No.

09/920,034

Examiner

Russell Frejd

Applicant(s)

CHIEN ET AL.

Art Unit

2128

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to applicant's filing on 1-August-2001.
2. ☒ The allowed claim(s) is/are 1-5.
3. ☒ The drawings filed on 01 August 2001 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All b) ☐ Some\* c) ☐ None of the:
    1. ☐ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
  - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
    - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
  - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08),  
Paper No./Mail Date \_\_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit  
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413),  
Paper No./Mail Date \_\_\_\_\_
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_

*RUSSELL FREJD*  
**RUSSELL FREJD**  
**PRIMARY EXAMINER**

In re Application of: Chien et al.

***Allowance of Application # 09/920,034***

1. The following communication is in response to applicant's filing on 1-August-2001.

***Examiner's Amendment***

2. An Examiner's Amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 C.F.R.

1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the Issue Fee. Authorization for this Examiner's Amendment was given by Jiawei Huang (Reg. No. 43,330) on November 10 and 18, 2004.

3. In the Claims:

In Claim 1:

line 3           Add --the-- between "determining" and "number".

line 8           Add --the-- between "using" and "measured".

lines 11-12   Delete "(or R-square represents degree of assessed variance explained by the model)" and Add --, where R-square represents the degree of assessed variance explained by the model--.

line 28       Delete "the same" and Add --a--.

                Add --the-- between "that" and "number".

line 29       Delete "to a tolerable range" and change "yield of semiconductor" to --the yield of the semiconductor--.

line 31       Change "errors" to --error-- and "follow" to --follows--.

In re Application of: Chien et al.

In Claim 3:

line 2            Change "intra-field" to --inter-field--.

In Claim 6:

Cancel claim 6.

### ***Reasons for Allowance***

4.        The following is an Examiner's Statement of Reasons for the indication of allowable subject matter. The instant application is directed to a non-obvious improvement over the information described in the article authored by Chien et al., entitled "Sampling Strategy and Model to Measure and Compensate the Overlay Errors", *Metrology, Inspection, and Process Control for Microlithography XV*, Proceedings-of-the-SPIE-The-International-Society-for-Optical-Engineering, Vol. 4344, 26 February-1 March, 2001, p. 245-256.

The improvement comprises a strategic sampling procedure for measuring overlay errors in the manufacture of semiconductor wafers, wherein integrative overlay error models, including parameters for inter-field translation, magnification, rotation, expansion and non-positive crossing, as well as intra-field translation, magnification and rotation, are used to provide a model for assessing and minimizing overlay errors and providing an optimal sampling strategy.

This patentable distinction is included in independent claim no. 1. The art of record, either individually or in combination, fails to teach, suggest, or render obvious the useful, concrete and tangible <integrative overlay model comprised of equations 23 and 24, the corresponding model parameters and the sampling strategy,> having the corresponding structure which is disclosed in the specification and equivalents thereof (at least at page 16, line

In re Application of: Chien et al.

2 through page 29, line 22, and Figures 1-21). In view of the foregoing, the claims of the present application are found to be patentable over the prior art.

***Response Guidelines***

5. Any comments considered necessary by applicant **MUST** be submitted no later than the payment of the Issue Fee and, to avoid processing delays, should preferably accompany the Issue Fee. Such submissions should clearly be labeled "Comments on Statement of Reasons for Allowance".

6. Any response to the Examiner in regard to this allowance should be

**directed to:** Russell Frejd, telephone number (571) 272-3779, Monday-Friday from 0530 to 1400 ET, or the examiner's supervisor, Jean Homere, telephone number (571) 272-3780.

**mailed to:** Commissioner of Patents and Trademarks  
Washington, D.C. 20231

**or faxed to:** (571) 273-3779

*Hand-delivered responses should be brought to 220 South 20<sup>th</sup> Street, Crystal Plaza Two, Lobby, Room 1B03, Arlington, VA., 22202.*

**Date:** 12-November-2004

RUSSELL FREJD

**RUSSELL FREJD  
PRIMARY EXAMINER**